

# DHRUV KUMAR

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## CONTACT INFORMATION

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## RESEARCH INTERESTS

Machine Learning, High Performance Computing, Neuromorphic Computing.

## EDUCATION

**University of Minnesota**, Twin Cities, United States **Sep 2017 - Present**  
*PhD in Computer Science*

- 3M Science and Technology Fellowship.

**Birla Institute of Technology and Science (BITS)**, Pilani, India **Aug 2010 - May 2014**  
*Bachelor of Engineering (Hons.) Computer Science*

- CGPA: **9.92 / 10.0**
- **Rank 1** in Class of 2014 of Computer Science, comprising of 120 students.
- **Rank 3** in Class of 2014 of BITS-Pilani, comprising of 800 students.
- **Relevant Courses:** Discrete Structures, Data Structures and Algorithms, Theory of Computation, Computer Organization, Operating Systems, Database Systems, Computer Networks, Programming Languages, Compiler Construction, Data Mining, Machine Learning.

## RESEARCH EXPERIENCE

**ADAPT Lab, BITS-Pilani** **Apr 2013 - Oct 2014**

**Project:** *A New Distributed Computing Framework for Data Mining*

**Mentors:** *Navneet Goyal, Poonam Goyal, Sundar Balasubramaniam*

- Designed and implemented data mining algorithms such as OPTICS, SLINK, DBSCAN for shared memory and distributed memory models.
- Used data distribution and task parallelism techniques for exploiting multicore and multinode architectures. Implemented using OpenMP and OpenMPI libraries in C.
- The work resulted in a number of publications. (See below)

## PUBLICATIONS

Poonam Goyal, Jagat Sesh Challa, **Dhruv Kumar**, Navneet Goyal, Sundar Balasubramaniam. *Grid-R-tree: A data structure for efficient neighborhood and nearest neighbor queries in data mining*, submitted for review in Journal of Data & Knowledge Engineering, Elsevier.[\[Link\]](#)

**Dhruv Kumar**, Poonam Goyal, Navneet Goyal. *An Efficient method for Batch Updates in OPTICS Cluster Ordering*, to appear in International Journal of Data Analysis Techniques and Strategies.[\[Link\]](#)

Poonam Goyal, Sonal Kumari, Ankit Sood, **Dhruv Kumar**, Sundar Balasubramaniam, and Navneet Goyal. *Exact, Fast and Scalable Parallel DBSCAN for Commodity Platforms*, in International Conference on Distributed Computing and Networking (ICDCN), 2017.[\[Link\]](#)

Poonam Goyal, Sonal Kumari, Sumit Sharma, **Dhruv Kumar**, Vivek Kishore, Sundar Balasubramaniam, and Navneet Goyal. *A fast, Scalable SLINK Algorithm for Commodity Cluster Computing Exploiting Spatial Locality*, in IEEE International Conference on High Performance Computing and Communications (HPCC), 2016.[\[Link\]](#)

Poonam Goyal, Sonal Kumari, **Dhruv Kumar**, Sundar Balasubramaniam, Navneet Goyal, Saiyedul Islam, and Jagat Sesh Challa. *Parallelizing OPTICS for Commodity Clusters* in International Conference on Distributed Computing and Networking (ICDCN), 2015.[\[Link\]](#)

Poonam Goyal, Sonal Kumari, **Dhruv Kumar**, Sundar Balasubramaniam, and Navneet Goyal. *Parallelizing OPTICS for multicore systems* in ACM India Computing Conference (ACM COMPUTE), 2014.[\[Link\]](#)

## PROFESSIONAL EXPERIENCE

### Several Startups *Technology and Strategy*

**Apr 2016 - Aug 2017**

- Designed and implemented the entire back-end for three startups from scratch.
- The entire back-end functionality was exposed using RESTful APIs implemented using Django web framework and hosted using Amazon web services.
- Gained valuable experience in building scalable and secure back-ends for web and mobile applications.

### Goldman Sachs, Bengaluru, India *Software Developer, Investment Management Division*

**Nov 2014 - Apr 2016**

- Improved the efficiency of risk-management system by suggesting improvements to the SQL queries going to Sybase IQ database.
- Assisted in migrating from Sybase IQ database to MemSQL database for faster access.
- Wrote APIs for accessing MemSQL database.
- Implemented a H2-database based server for allowing real-time updates to the tables residing in the servers.
- Learnt about the real life use-cases of databases.

### CSIR-CEERI, Pilani, India *Summer Intern*

**May 2012 - July 2012**

- Studied, compared and implemented various unsupervised machine learning algorithms.
- Learnt about the use of these algorithms in real world applications

## SELECTED ACADEMIC PROJECTS

### Restaurant Recommender System

**Oct 2013 - Nov 2013**

- An application which can recommend suitable restaurants based on user inputs of location, type of cuisine, type of meal, etc.
- Restaurant reviews taken from yelp.com and processed using NLP techniques.

### Compiler Construction for a Toy Language

**Jan 2013 - Apr 2013**

- Designed lexical, syntax, semantic, code generation phases of compiler in C.
- Efficient use of Hash Tables for constructing symbol tables.

### Transcripts Website for BITS, Pilani

**Feb 2012 - Aug 2013**

- Used by BITS students and alumni for the application of Duplicate Transcripts and Grade Sheets.
- Built using ASP.NET, C#.NET, Microsoft Visual Studio, MS SQL Server.

## TECHNICAL SKILLS

- **Programming:** C, Java, Python, OpenMPI, OpenMP, MySQL, Verilog, Matlab
- **Mobile and Web Technologies:** HTML, CSS, JavaScript, AngularJS, Django, Android
- **Cloud platforms:** Amazon web services

## HONORS AND AWARDS

- Awarded merit scholarship of total worth Rs 4,75,000 for being in top 10 students among 800 students of BITS, Pilani by the institute. **[Aug, 2010 - May 2014]**
- Awarded research incentive fellowship of Rs 25,000 in recognition of the contribution in the undergraduate thesis project. **[May 2014]**
- Selected for attending 4th South Asia Workshop on Research Frontiers in Computer Science at NUS School of Computing, Singapore. **[May 2014]**